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## LD 34: Tone and Digit Switch and Digitone Receiver Diagnostic

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This program tests circuit cards used in generating and detecting tones in the Meridian 1/Meridian SL-1 system. If loaded automatically in background or as part of the daily routines, it tests the hardware and performs fault detection and isolation. If invoked manually, commands can be issued to conduct the entire test or only certain parts of the test and to change card status.

The program tests the following circuit cards:

- Tone and Digit Switch (TDS)
- Flexible Tone and Digit Switch
- Digitone Receiver (DTR)
- Tone Detector
- Dial Tone Detector
- Extended Tone Detector (XTD)

TDS circuit card outpulsers and channels are checked for timing errors, memory faults and Digitone frequency accuracy. Digitone receivers are checked for response to all Digitone frequencies. Tones and outpulses are tested from a maintenance set.

## Basic commands

The following commands are applicable to all machines, except Option 11 systems. See the list of Option 11 commands for further information.

|                |                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------|
| CDSP           | Clear the maintenance display on active CPU to 00 or blank                                               |
| CMAJ           | Clear major alarm and reset power fail transfer                                                          |
| CMIN ALL       | Clear minor alarm indication on all attendant consoles                                                   |
| CMIN c         | Clear minor alarm indication on attendant consoles for customer c                                        |
| DISD l s c     | Disable the specified Meridian 1/Meridian SL-1 Tone Detector card                                        |
| DISD l s c u   | Disable specified Dial Tone Detector                                                                     |
| DISL loop      | Disable tone and digit loop                                                                              |
| DISR l s c (u) | Disable specified DTR/MFR card or unit. Applies to DTR or XTD packs.                                     |
| DISX l         | Disable Conf/TDS/MFS card on loop l and l + 1                                                            |
| DTD l s c u    | Test specified Dial Tone Detector unit. Applies to DTD and XTD packs.                                    |
| DTR l s c (u)  | Test specified Digitone receiver card or unit. Applies to DTR and XTD packs.                             |
| END            | Stop execution of current command                                                                        |
| ENLD l s c (u) | Enable Tone Detector on specified card or unit                                                           |
| ENLL loop      | Enable tone and digit loop                                                                               |
| ENLR l s c (u) | Enable the DTR/MFR card or unit. Applies to DTR and XTD packs.                                           |
| ENLX l         | Enable Conf/TDS/MFS card on loop l and l + 1                                                             |
| MFR            | Test all Automatic Number Identification Feature Group D Multifrequency receiver units                   |
| MFR loop       | Test all Automatic Number Identification Feature Group D Multifrequency receiver units on specified loop |
| MFR l s c (u)  | Test Automatic Number Identification Feature Group D Multifrequency card or unit                         |
| SDTR l s c (u) | Get status of specified DTR/MFR or XTD card or unit.                                                     |
| STAD           | List all disabled Tone Detector units                                                                    |
| STAD l s c (u) | Get status of Tone Detector card or unit                                                                 |
| STAT           | List TNs of all disabled DTRs and MFRs                                                                   |
| STAT loop      | Get status TDS loop                                                                                      |
| TDET l s c (u) | Perform self-test and tone detection on specified card or unit                                           |
| TDS loop       | Test outpulsers and channels on specified loop                                                           |

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## Option 11 commands

The following commands are applicable to Option 11 systems:

|            |                                                                              |
|------------|------------------------------------------------------------------------------|
| CDSP       | Clear the maintenance display on active CPU to 00 or blank                   |
| CMAJ       | Clear major alarm and reset power fail transfer                              |
| CMIN ALL   | Clear minor alarm indication on all attendant consoles                       |
| CMIN c     | Clear minor alarm indication on attendant consoles for customer c            |
| DISR c (u) | Disable specified DTR/MFR card or unit                                       |
| DISX c     | Disable the TDS/MFS card                                                     |
| DISX I     | Disable Conf/TDS/MFS card on loop I and I + 1                                |
| DTR c (u)  | Test specified Digitone receiver card or unit                                |
| END        | Stop execution of current command                                            |
| ENLR c (u) | Enable DTR/MFR card or unit                                                  |
| ENLX c     | Enable the TDS/MFS card                                                      |
| ENLX I     | Enable Conf/TDS/MFS card on loop I and I + 1                                 |
| MFR        | Test all Automatic Number Identification (ANI) Multifrequency receiver units |
| MFR c      | Test all MFR units on card c (Option 11)                                     |
| MFR c (u)  | Test ANI Feature Group D Multifrequency card or unit (Option 11)             |
| SDTR       | List all disabled DTR units                                                  |
| SDTR c (u) | Get status of specified DTR or XTD unit(s) on the CPU, SSTD, or XTD card     |
| STAT       | List TNs of all disabled DTRs and MFRs                                       |
| STAT c     | Show TDS status and number of disabled or busy tone transmitter channels.    |
| TDS card   | Test outpulsers and channels                                                 |

## Extended Tone Detector (XTD) commands

The following commands are applicable to the NT5K20 and NT5K48 XTD cards:

|                |                                                         |
|----------------|---------------------------------------------------------|
| DISR I s c (u) | Disable the specified XTD card (or unit)                |
| DTR I s c u    | Test the specified XTD unit as a Digitone receiver unit |
| ENLR I s c (u) | Enable the specified XTD card (or unit)                 |
| SDTR           | List Terminal Numbers (TN) of all disabled DTR units    |
| SDTR I s c (u) | List the status of the specified XTD card (or unit)     |

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## Maintenance telephone commands

The following commands are used from a Maintenance telephone to test and hear the various tones. Both the command and the dial pad equivalents (in parantheses) are shown.

|                                                                                                                                                 |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ANNx#loop## (266x#loop##)                                                                                                                       | basic-6 |
| Provides signals coming through source number x of KAPSCH Digital Announcer or Music Interface. Where loop = Tone and Digit Switch loop number) |         |
| BSY#loop## (279#loop##)                                                                                                                         | basic-1 |
| Provide busy tone from tone and digit loop.                                                                                                     |         |
| C## (2##)                                                                                                                                       | basic-1 |
| Remove any active tone.                                                                                                                         |         |
| CMP#loop## (267#loop##)                                                                                                                         | basic-1 |
| Provide Camp-On tone from loop.                                                                                                                 |         |
| CUST#xx## (2878#xx##)                                                                                                                           | basic-1 |
| Test outpulsing for customer XX.                                                                                                                |         |
| CWG#loop## (294#loop##)                                                                                                                         | basic-1 |
| Give call waiting tone from loop.                                                                                                               |         |
| DIA#loop## (342#loop##)                                                                                                                         | basic-1 |
| Provide dial tone from tone and digit loop.                                                                                                     |         |
| DRNG#loop## (3764#loop##)                                                                                                                       | basic-1 |
| Provide distinctive ringing from loop.                                                                                                          |         |
| ITN#loop## (486#loop##)                                                                                                                         | basic-1 |
| Provide intrusion tone from loop.                                                                                                               |         |
| JDRG#loop## (5374#loop##)                                                                                                                       | basic-8 |
| Provide distinctive ringing from loop.                                                                                                          |         |
| JIDT#loop## (5438#loop##)                                                                                                                       | basic-8 |
| Provide interrupted dial tone from loop.                                                                                                        |         |
| OPS#loop#x## (677#loop#x##)                                                                                                                     | basic-1 |
| Test outpulsing from Meridian 1/Meridian SL-1 to idle trunk.                                                                                    |         |

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|                                                                                                                                                                                    |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ORD#loop## (673#loop##)<br>Provide override tone from loop.                                                                                                                        | basic-1 |
| OVF#loop## (683#loop##)<br>Provide overflow tone from loop.                                                                                                                        | basic-1 |
| PCRT#loop## (7278#loop##)<br>Test the Paid Call Restriction (PCR) tone after the TABL command.                                                                                     | pcr-7   |
| RBK#loop## (725#loop##)<br>Provide ringback tone from loop.                                                                                                                        | basic-1 |
| RNG#loop## (764#loop##)<br>Provide ring tone from loop.                                                                                                                            | basic-1 |
| SDL#loop## (735#loop##)<br>Give special dial tone from loop.                                                                                                                       | basic-1 |
| TABL#xx## (8225#xx##)<br>Select table number xx. If this command is not issued before any tone request command, then table 0 is assumed (Generic X11 with supplementary features). | basic-1 |
| TLP#loop## (857#loop##)<br>Provide tone to last party from the tone and digit loop.                                                                                                | basic-4 |
| TST#loop## (878#loop##)<br>Provide test tone from loop.                                                                                                                            | basic-1 |
| XCTT#loop#t#c## (9288#loop#t#c##)<br>Test tone and cadence number on Conference/TDS/MFS card.                                                                                      | xct-15  |

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## Alphabetical list of commands

| Command                   | Description                                                                                                                                      | Pack/Rel |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| ANNx#loop## (266x#loop##) | Provides signals coming through source number x of KAPSCH Digital Announcer or Music Interface. Where: loop = Tone and Digit Switch loop number. | basic-6  |
| BSY#L## (279#L##)         | Provide busy tone from tone and digit loop L.                                                                                                    | basic-1  |
| C## (2##)                 | Remove any active tone.                                                                                                                          | basic-1  |
| CDSP                      | Clear the maintenance display on active CPU to 00 or blank.                                                                                      | basic-1  |
| CMAJ                      | Clear major alarm, reset power fail transfer and clear power fault alarm.                                                                        | basic-1  |
| CMIN ALL                  | Clear minor alarm indication on all attendant consoles.                                                                                          | basic-1  |
| CMIN c                    | Clear minor alarm indication on attendant consoles for customer c.                                                                               | basic-1  |
| CMP#loop## (267#loop##)   | Provide Camp-On tone from loop.                                                                                                                  | basic-1  |
| CUST#xx## (2878#xx##)     | Test outpulsing for customer XX.                                                                                                                 | basic-1  |
| CWG#loop## (294#loop##)   | Give call waiting tone from loop.                                                                                                                | basic-1  |
| DIA#L## (342#L##)         | Provide dial tone from tone and digit loop L.                                                                                                    | basic-1  |
| DISD I s c                | Disable the specified Meridian 1/Meridian SL-1 Tone Detector card. Disables both units and lights the LED. (not supported on Option 11)          | basic-1  |
| DISD I s c u              | Disable specified Dial Tone Detector.<br>If both units on the card are disabled, the LED lights.<br>(not supported on Option 11)                 | basic-1  |

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|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| DISL loop                 | Disable tone and digit loop.<br>For Conference/TDS/MFS cards see note with ENLL command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | basic-1  |
| DISR c (u)                | Disable specified DTR/MFR or XTD card or unit. (Option 11)<br><i>For Option 11C:</i> this command applies to any units on card 0 regardless of its configured type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | xtd-8    |
| DISR l s c (u)            | Disable specified DTR/MFR or XTD card or unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | xtd-8    |
| DISX c                    | Disable the TDS/MFS card (Option 11)<br><i>For Option 11C:</i> this command disables TDS and all units (0-15) on card 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | basic-22 |
| DISX l                    | Disable Conf/TDS/MFS card on loop l and l + 1.<br><br>Disables the entire combined Conference, Tone and Digit Switch, and MF Sender (NT8D17) card. Both the even numbered TDS/MFS loop and adjacent conference loop are disabled. loop = 0, 2, 4, . . . 158<br><br>The DISL and ENLL commands can be used on the even number loop for the TDS/MFS functions. However, this only prevents the loop from being used by software and does not affect the hardware status of the card.<br><br>The DISX and ENLX commands are recommended. The ENLX command must be used if the DISX command was used to disable the card.<br><br>This command can be used in LD 34, LD 38 and LD 46. | xct-15   |
| DRNG#loop## (3764#loop##) | Provide distinctive ringing from loop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | basic-1  |
| DTD l s c u               | Test specified Dial Tone Detector unit.<br><br>Applies to DTD and XTD packs. The Dial Tone Detector Test (DTDT) parameters must be configured in the configuration record (LD 17). Faulty DTD packs are disabled. Only 50% of all Dial Tone Detectors in the system may be disabled.                                                                                                                                                                                                                                                                                                                                                                                             | xtd-8    |
| DTR c (u)                 | Test specified unit on Digitone receiver card or unit. (Option 11)<br><i>For Option 11C:</i> this command is applicable to DTR units 0-7 and 8-15.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | basic-1  |



|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| DTR I s c (u)  | Test specified unit on Digitone receiver card or unit .<br><br>This test may be performed while the card is enabled or disabled. If a disabled card passes the test, it is enabled automatically. This command also applies to the XTD.                                                                                                                                                                                                                                                                         | xtd-8    |
| END            | Stop execution of current command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | basic-1  |
| ENLD I s c (u) | Enable Tone Detector on specified card or unit. (not supported on Option 11)                                                                                                                                                                                                                                                                                                                                                                                                                                    | basic-1  |
| ENLL I         | Enable tone and digit switch loop I.<br><br>For Conference/TDS/MFS cards the DISX and ENLX commands must be used whenever the faceplate switch of the card has been toggled. ENLL will software enable the card but the card will not be properly reset.                                                                                                                                                                                                                                                        | basic-1  |
| ENLR c (u)     | Enable the DTR/MFR or XTD card or specified unit. (Option 11)<br><br><i>For Option 11C:</i> this command applies to any units on card 0 regardless of its configured type.                                                                                                                                                                                                                                                                                                                                      | xtd-8    |
| ENLR I s c (u) | Enable the DTR/MFR or XTD card or specified unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                               | xtd-8    |
| ENLX c         | Enable the TDS/MFS card<br><br><i>For Option 11C:</i> This command enables TDS and all units on card 0. For Card 0, this command initiates the card reset sequence: it downloads any parameters required for any configured MFC/MFE/MFK5/MFK6 units.                                                                                                                                                                                                                                                            | basic-22 |
| ENLX I         | Enable Conf/TDS/MFS card on loop I and I + 1.<br><br>This command can be used in LD 34, LD 38 and LD 46.<br><br>Enables the entire combined Conference, Tone and Digit Switch, and MF Sender (NT8D17) card. Both the even numbered TDS/MFS loop and adjacent conference loop are enabled. (loop = 0, 2, 4, . . . 158) The Conf/TDS card is not enabled automatically when it is inserted.<br><br>Both loops must have been previously disabled. This command initiates card tests and the download of software. | xct-15   |

The DISL and ENLL commands can be used on the even number loop for the TDS/MFS functions. However, this only prevents the loop from being used by software and does not affect the hardware status of the card. The DISX and ENLX commands are recommended. The ENLX command must be used if the DISX command was used to disable the card.

Enabling more than 16 conference loops may cause the system to lock-up.

|                           |                                                                                              |         |
|---------------------------|----------------------------------------------------------------------------------------------|---------|
| ITN#loop## (486#loop##)   |                                                                                              | basic-1 |
|                           | Provide intrusion tone from loop.                                                            |         |
| JDRG#loop## (5374#loop##) |                                                                                              | basic-8 |
|                           | Provide distinctive ringing from loop.                                                       |         |
| JIDT#loop## (5438#loop##) |                                                                                              | basic-8 |
|                           | Provide interrupted dial tone from loop.                                                     |         |
| MFR                       | Test all Automatic Number Identification (ANI) Multifrequency receiver units.                | fgd-17  |
|                           | <i>For Option 11C:</i> this command includes card 0 MFR units                                |         |
| MFR c                     | Test all MFR units on card c (Option 11)                                                     | fgd-17  |
|                           | <i>For Option 11C:</i> this command is applicable to card 0 units if they are MFR units      |         |
| MFR c (u)                 | Test Automatic Number Identification (ANI) Multifrequency receiver card or unit. (Option 11) | fgd-17  |
|                           | <i>For Option 11C:</i> this command is applicable to card 0 units if they are MFR units      |         |
| MFR loop                  | Test all Automatic Number Identification (ANI) Multifrequency receivers on this loop.        | fgd-17  |
| MFR l s c (u)             | Test Automatic Number Identification (ANI) Multifrequency receiver card or unit.             | fgd-17  |

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| OPS#L#xx## (677 #L #xx##)                                                                                                                                                                                                                                     | basic-1 |
| Test outpulsing from Meridian 1/Meridian SL-1 to idle trunk.                                                                                                                                                                                                  |         |
| Outpulses from tone and digit loop I using the 10 or 20 pps outpulser to any idle trunk. This command connects the Meridian 1/Meridian SL-1 maintenance telephone to the trunk, permitting a test call on the trunk to be made using the outpulsers selected. |         |
| Where :                                                                                                                                                                                                                                                       |         |
| • xx = 10 or 20 representing the trunk class of service (LD 14 CLS = P10 or P20).                                                                                                                                                                             |         |
| When the test call is completed, LD 34 must be reloaded by dialing SPRE + 91 before entering another command.                                                                                                                                                 |         |
| ORD#loop## (673#loop##)                                                                                                                                                                                                                                       | basic-1 |
| Provide override tone from loop.                                                                                                                                                                                                                              |         |
| OVF#L## (683#L##)                                                                                                                                                                                                                                             | basic-1 |
| Provide overflow tone from loop L.                                                                                                                                                                                                                            |         |
| PCRT#loop## (7278#loop##)                                                                                                                                                                                                                                     | pcr-7   |
| Test the Paid Call Restriction (PCR) tone after the TABL command.                                                                                                                                                                                             |         |
| RBK#L## (725#L##)                                                                                                                                                                                                                                             | basic-1 |
| Provide ringback tone from loop L.                                                                                                                                                                                                                            |         |
| RNG#L## (764#L##)                                                                                                                                                                                                                                             | basic-1 |
| Provide ring tone from loop L.                                                                                                                                                                                                                                |         |
| SDL#loop## (735#loop##)                                                                                                                                                                                                                                       | basic-1 |
| Give special dial tone from loop.                                                                                                                                                                                                                             |         |
| SDTR                                                                                                                                                                                                                                                          | xtd-8   |
| List the TNs of all disabled DTR/MFR or XTD units                                                                                                                                                                                                             |         |
| SDTR                                                                                                                                                                                                                                                          | basic-1 |
| List all disabled DTR units                                                                                                                                                                                                                                   |         |
| SDTR c (u)                                                                                                                                                                                                                                                    | basic-1 |
| Get status of specified DTR or XTD card or unit. (Option 11)                                                                                                                                                                                                  |         |
| <i>For Option 11C:</i> This command provides the status of all units 0-11 or 0-15 for card 0, regardless of configured type.                                                                                                                                  |         |

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|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| SDTR l s c (u)        | Get status of specified DTR/MFR or XTD card or unit.<br><br>If no parameters are entered, a list of all DTR/MFR TNs is output. If l s c is input, the status of the DTR/MFR units on the specified card are output. If l s c u is input, the status of the specified unit is output. Applies to DTR and XTD packs.              | basic-1 |
| STAD                  | List all disabled Tone Detector units. (not supported on Option 11)                                                                                                                                                                                                                                                             | basic-1 |
| STAD l s c (u)        | Get status of Tone Detector card or unit.<br>The status is either idle, busy, maintenance busy or not equipped.                                                                                                                                                                                                                 | basic-1 |
| STAT                  | List TNs of all disabled Digitone Receivers. NONE is output if there are no disabled Digitone Receivers.<br><br><i>For Option 11C:</i> this command lists TNs of all disabled DTRs and includes all card 0 DTR/XTD units.                                                                                                       | basic-1 |
| STAT c                | Show TDS status and number of disabled or busy tone transmitter channels. The STAT c command is used for the SSTD or CPU card.                                                                                                                                                                                                  | basic-1 |
| STAT loop             | Get status TDS loop.<br>The response may include OPS DSBL, indicating that the outpulsing function of the TDS card has been disabled.                                                                                                                                                                                           | basic-1 |
| TABL#xx## (8225#xx##) | Select table number xx. If this command is not issued before any tone request command, then table 0 is assumed (Generic X11 with supplementary features).                                                                                                                                                                       | basic-1 |
| TDET l s c (u)        | Perform self-test and tone detection on specified card or unit.<br><br>Performs the self-test and basic tone detection functions of the Meridian 1/Meridian SL-1 Tone Detector card or unit. This test may be performed while the card is enabled or disabled. If a disabled card passes the test, it is enabled automatically. | basic-1 |
| TDS loop              | Test outpulsers and channels on specified loop.<br><br>Tests the outpulsers and channels of the tone and digit switch at loop. Outpulsers and tones are tested with a maintenance telephone (see commands from maintenance telephone).                                                                                          | basic-1 |

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|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| TDS card                      | <p>Test outpulsers and channels on specified card. (Option 11)<br/>When the Fast Tone and Digit Switch (FTDS) package 87 is equipped, it:</p> <ul style="list-style-type: none"> <li>— tests the outpulsers and channels of the tone and digit switch</li> <li>— outpulses 32 digits to a DTR, receives and stores the 32 digits from the DTR</li> <li>— tests that the time to outpulse 32 digits is within an acceptable range</li> <li>— compares the outpulsed 32 digits with those received and displays OK if they match</li> </ul> | basic-1 |
| TLP#loop## (857#loop##)       | <p>Provide tone to last party from the tone and digit loop.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | basic-4 |
| TST#loop## (878#loop##)       | <p>Provide test tone from loop.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | basic-1 |
| XCTT# L#t#c## (9288# L#t#c##) | <p>Test tone and cadence number on Conference/TDS/MFS card.</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• L = loop number of Conference/TDS/MFS (NT8D17) card</li> <li>• t = tone number</li> <li>• c = cadence number</li> </ul> <p>Refer to Flexible Tone and Digit Switch cards (553-2711-180) for the Conference/TDS tone and cadence numbers.</p>                                                                                                                                                                       | xct-15  |

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